

Taxonomic Notes on Costa Rican Mendesellinae (Ichneumonoidea: Braconidae), with Description of a New Central American Species of *Mendesella*

A. A. VALERIO¹ AND J. B. WHITFIELD

(AAV) Central American Institute of Biological Research and Conservation (CIBRC), P.O. Box 2398-2050 San Pedro de Montes de Oca, San José, Costa Rica, e-mail: avalerio@cibrc.org; (JBW) Department of Entomology, University of Arkansas, Fayetteville, Arkansas 72701, USA, e-mail: jwhitfie@comp.uark.edu.

Abstract.—One new species of mendeselline braconid wasp is described, *Mendesella orianae* Valerio and Whitfield sp. nov., and the male of *Epsilogaster tico* Whitfield and Mason is described for the first time. *Mendesella orianae* from Costa Rica represents the northernmost record of *Mendesella* in the Americas, and the first recorded species of this genus in Costa Rica. The male genitalia of *E. tico* is also described, providing the first record of male genitalic characters for the subfamily Mendesellinae.

The braconid subfamily Mendesellinae was described by Whitfield & Mason (1994), who included two genera and nine species, all new. So far as is known, the species are endoparasitoids of Lepidoptera feeding within plant tissue, but biological records are sparse, and specimens of this subfamily are rarely collected in general. Since the original description there has been no further review of the distribution and biology of the known species, nor any further species described. Recently, new specimens of both genera in the subfamily have been discovered by the senior author in the collections of the Instituto Nacional de Biodiversidad (INBio). The new records add significantly to the known geographical distribution of mendeselline genera, as well as the morphology of male Mendesellinae. One of the species is new to science and it is describe below.

MATERIAL AND METHODS

The morphological terminology used in the species descriptions is that of Huber and Sharkey (1993), and Schuh (1989); except for the morphology of the propodeum, which is used *sensu* Townes (1969, Fig. E). The cuticular sculpturing terminology is that of Harris (1979), while the terminology for the wing venation is a variation of the Comstock-Needham system used by Sharkey and Wharton (1997, Fig. 15).

The metasoma of one specimen of *Epsilogaster tico* was detached, placed in warm 10% KOH overnight, and run through ethanol and xylene baths into Euparal mounting medium for slide-mounting. The male genitalia were pulled away from the remainder of the metasoma and illustrated using a microprojector.

Epsilogaster tico Whitfield and Mason 1994

(Figs. 1a, 2, 3)

Male.—Body color: Mainly light yellow; scape and pedicel light brown as face, vertex, frons, hind tarsomeres, middle telo-

¹ Current Address: Department of Entomology, University of Arkansas, Fayetteville, AR 72701 USA, e-mail: avaleri@comp.uark.edu.

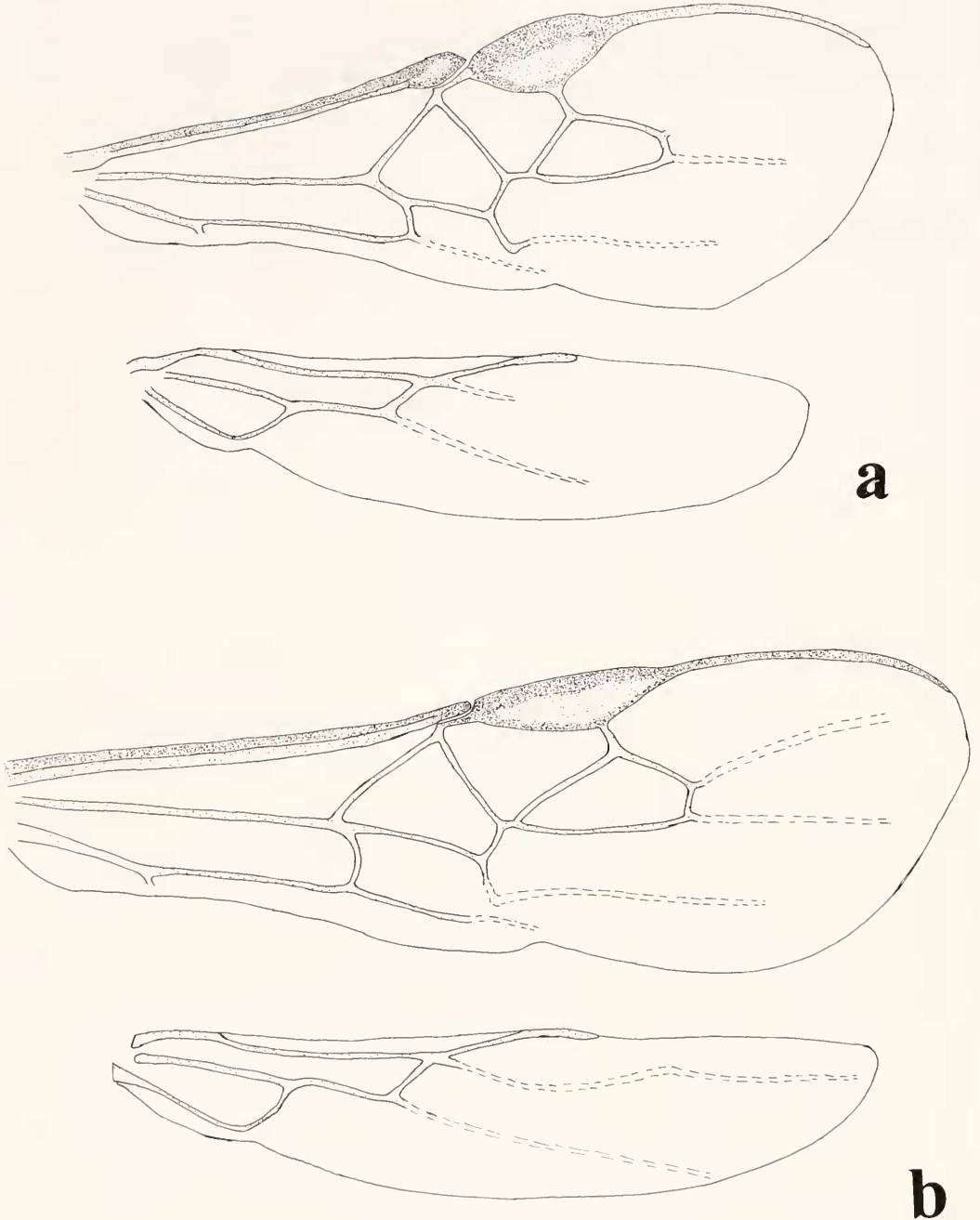
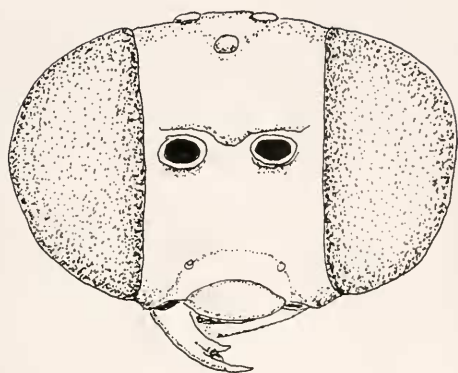


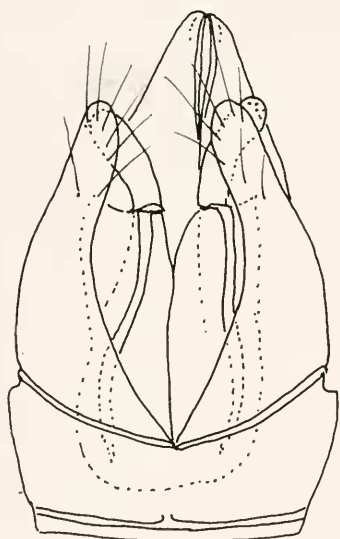
Fig. 1. Wing venation for male *Epsilogaster tico* Whitfield & Mason (a), and for female *Mendesella orianae* Valerio & Whitfield sp. nov. (b).

tarsus and metasomal terga 4-6; metanotum with darker yellow than remainder mesosoma; compound eyes silver; palpus whitish-yellow. Fore and hind wings hy-

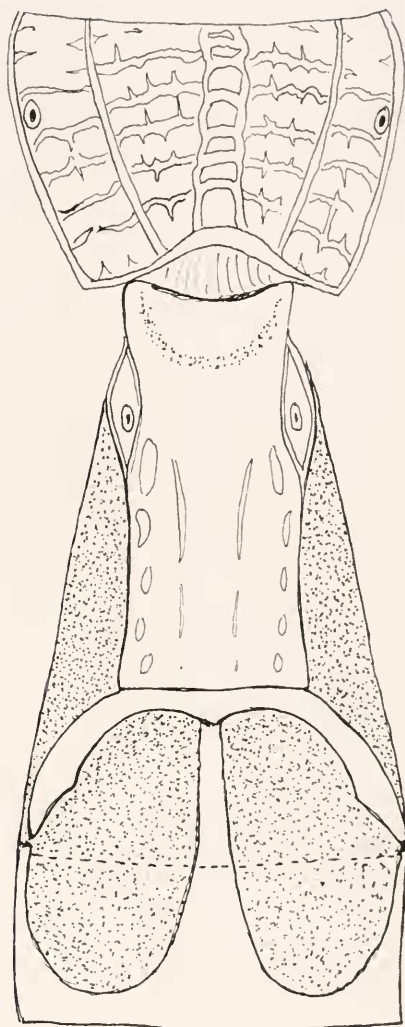
aline (Fig. 1a); wing veins with light yellow coloration. Body length = 2.61-2.75 mm; Fore wing length = 2.44-2.47 mm. **Head:** head height/compound eye height



2



3



4

Figs. 2-4. 2,3. *Epsilogaster tico*, male. 2, Face, showing enlarged eyes. 3, Genital capsule. 4, Propodeum and anterior metasomal tergites of *Mendescella oriana*, sp. nov.

= 1.17-1.18; head height/compound eye length = 1.53-1.65; length of first antennal flagellomere = 0.18-0.22 mm; length of first antennal flagellomere/width of first antennal flagellomere = 4.40-5.20; length of first antennal flagellomere/length of second antennal flagellomere = 1.29-1.44; length of first antennal flagellomere/

length of third antennal flagellomere = 1.38-1.44; distal flagellomere length/width of distal flagellomere = 4.67-5.0; intertentorial pit distance = 0.13-0.16 mm; ocell-ocular distance = 0.03-0.04 mm; distance between toruli and tentorial pits = 0.25-0.27 mm; face wide at dorsal edge of clypeus = 0.28 mm. Antenna with 27 fla-

gellomeres; face nitid, without punctate sculpturing, but with few scattered obscure rugulose sculpturing features; vertex and gena with coarsely-punctate sculpturing as on posterior-ventral area of head; occiput nitid; malar suture present; malar space very short; ocelli forming an equilateral triangle. **Mesosoma:** mesosomal length/mesosomal width = 1.43–1.55, mesosomal height = 0.60–0.61 mm; hind tibia length/hind tibia maximum width = 3.60–3.89; propleural distal edge with a ridge; pronotum with mid longitudinal area with scrobiculate sculpturing; mesonotum evenly setose throughout; notaulus conspicuously foveate throughout; area at notaulus union without a depressed area and some punctate sculpturing present by setae; union of notaulus near transscutal articulation; transscutal articulation with a smooth carina that is absent laterally; scutellar sulcus wide, with 3 deep pits present; scutellum subpentagonal, without any posterior apico-medial pits or sculpturing; antero-medial area of metanotum with two subcircular pits, remainder of medial area nitid; axillary troughs of mesonotum with spaced scrobiculate sculpturing; metapleuron dorsally nitid, remainder with areolate-rugulose sculpturing present; propodeum, parallel mid-longitudinal carinae united by complete transversal carinae between them, remainder with areolate-rugulose sculpturing present, latero-longitudinal carinae cristate as mid-longitudinal carinae (no other carinae as cristate), areas between carinae nitid or with fine obscure colliculate sculpturing present. **Metasoma:** distal width of tergum 1/ basal width of tergum 1 = 0.38–0.39; length of tergum 1/ distal width of tergum 1 = 4.0–4.40; first metasomal tergum: dorso-lateral carinae with well-defined and cristate dorsal carinae curving close to one another apically and extending 0.70 length of tergum, conspicuously cristate basally; rugulose sculpturing densely present dorsally on tergum, remainder with more widely spaced rugu-

lose sculpturing, medial area raised forming two semicircular lower areas that contain 5 costulae each; terga 2–6 smooth and unsculptured, also terga 2–6 much more strongly desclerotized than first metasomal tergum.

Material examined.—Described from two males: Costa Rica, Alajuela, RNVs Caño Negro, Playuelas, 20 m. 1–18/ii/1994, Col. K. Martinez.

Comments.—The studied males have a more elongate metasoma and strongly enlarged compound eyes than the known female (Fig. 2). Also, *E. tico* male eyes are strongly enlarged in comparison with those described for *E. bicolor*, the only other males known for the genus.

The male genitalia (Fig. 3) are the first to be described for a mendeselline braconid. As with most Cardiochilinae and Microgastrinae (Maetô 1996), the cuspis and digitus freely articulate, and there are about 10 very small teeth distally on the digitus, as in some Cardiochilinae. The basal ring is longer than in most microgastrines (i.e., forms a broad transverse band), but shorter than in some derived microgastrine genera. Thus for the most part, mendeselline male genital capsules exhibit relatively plesiomorphic features, as would be expected from their proposed phylogenetic relationships (Whitfield and Mason 1994).

Mendesella orianae Valerio & Whitfield
sp. nov.
(Figs. 1b, 4)

Male.—Body color: Mainly honey yellow, with antennal flagellomeres as dark brown as inter-ocellar space; scape and pedicel light brown, metasomal terga 2–7 (except median area of tergum 2 and 3 whitish-yellow), hind tibia distal 1/5 and fore as middle leg telotarsus. First metasomal tergum with lateral areas yellow. Head, mesonotum and hind tibia with a darker tone of yellow than mesopleuron coloration; compound eyes silver; palpus whitish-yellow.

Fore and hind wing slightly infuscate throughout; wing veins light brownish-yellow, except hind RS and 2M nebulous (with a short basal area tubular) with a dark brown coloration. Body length = 3.80 mm; Fore wing length = 3.19 mm. **Head:** head height/compound eye height = 1.25; head height/compound eye length = 1.67; length of first antennal flagellomere = 0.26 mm; length of first antennal flagellomere/width of first antennal flagellomere = 3.2; length of first antennal flagellomere/length of second antennal flagellomere = 1.33; length of first antennal flagellomere/length of third antennal flagellomere = 1.45; distal flagellomere length/width of distal flagellomere = 3.0; intertentorial pit distance = 0.18 mm; ocell-ocular distance = 0.05 mm; distance between toruli and tentorial pits = 0.28 mm; face wide at dorsal edge of clypeus = 0.36 mm. Antenna with 38 flagellomeres, distal flagellomere with a long and thick spine; face, frons, vertex, gena (except ventral area) densely punctate; clypeus mainly nitid, with scattered punctate sculpturing present; malar suture present; malar space very short; ocelli forming an equilateral triangle. **Mesosoma:** mesosomal length/mesosomal width = 1.64, mesosomal height = 0.82 mm; hindtibial length/hindtibial width = 3.5; Pronotal lateral areas with few obscure longitudinal lineate sculpturing; mesonotum evenly punctate throughout as setose; notaulus foveate anteriorly, remainder with obscure foveate sculpturing; area at notaulus union with rugulo-punctate sculpturing in a depressed area; union of notaulus near transscutal articulation; mesopleuron nitid, setose ventrally and remainder scattered setose; sternaulus obscurely impressed and nitid; transscutal articulation with a smooth carina; scutellar sulcus deep and wide, with 9 conspicuous pits present; scutellum subpentagonal, with two subrectangular pits close to one another at posterior apico-median area; antero-medial area of metanotum with two

subcircular pits near scutellar subrectangular pits, distal edge punctate throughout; axillary troughs of mesonotum with coarsely-rugose sculpturing; propodeum with parallel mid-longitudinal carinae united by transversal carinae between them, remainder with areolate-rugulose sculpturing present, latero-longitudinal carinae as cristate as mid-longitudinal carinae (no other carinae as strongly cristate). **Metasoma:** Distal width of tergum 1/Basal width of tergum 1 = 1.10; Length of tergum 1/Distal width of tergum 1 = 2.11; first metasomal tergum, dorso-lateral carinae strong, dorsal carinae curving close to another apically and not conspicuously cristate, rugulose sculpturing throughout tergum, medial area raised forming two semicircular lower areas that contain 5 costulae each; terga 2–6 smooth and unsculptured; tergum 2 with a "E" shaped form, the mid-dorsal part as strongly sclerotized as lateral areas of it, but not reaching half of the length of the tergum.

Holotype.—Costa Rica, Guanacaste, Parque Nacional Guanacaste, Estac. Los Almendros, 300 m. 23/iii-28/iv/1994, Col. E. López. Deposited in INBio.

Comments.—This species is similar to *Mendesella magna* and *M. braziliensis*, both described by Whitfield & Mason (1994), but can be separated from them by the absence of two elongated mid-lateral pits on the first metasomal tergum, by metasomal tergum 2 having an "E" shaped form with the mid-dorsal area as strongly sclerotized as the lateral areas, and the presence of rugulose sculpturing throughout the first metasomal tergum. Also, *M. oriana* can be separated from any other *Mendesella* species by the fore wing pattern of very weak infuscation, the mesopleuron and pronotum not being darkened, the smaller body size, and the darker metasomal terga 3–6.

Etymology.—Gender: feminine. The present species is named in honor of Oriana Valerio Contreras; live longer and prosper!

DISCUSSION

At present, the appearance of *Mendesella oriana* in Costa Rica expands the northern limit of known distribution for the genus *Mendesella*. Until now, the genus was reported only from Brazil, Bolivia and Ecuador (Whitfield & Mason 1994) with no observed specimens of the genus in the Caribbean zone of America. In contrast, the genus *Epsilogaster* has a reported northern limit of the southern U.S. (including the Caribbean area), with a southern limit in Brasil. The present observed sparse distribution is likely to be the result of the lack of specimens collected in other areas, in combination with the difficulty of identifying braconid wasps.

ACKNOWLEDGMENTS

We would like to thank The Instituto Nacional de Biodiversidad (INBio) for the loan of their mendeselline material. Thanks also to Axel Retana for his accurate comments, to Andy Deans for his help in the wing drawing technique, to "la canalla biológica de la calle de la perdición" in Costa Rica for their constant support, and of course to "Cukha" for her unconditional presence.

LITERATURE CITED

- Harris, R. A. 1979. A glossary of surface sculpturing. *Occasional Papers of the Bureau of Entomology of the California Department of Agriculture*. No. 28, p 32.
- Huber, J. T. and M. J. Sharkey. 1993. Structure, Chapter 3. Pp 13–59. In: Goulet, H. and J.T. Huber (eds.), *Hymenoptera of the world: An identification guide of families*, Agriculture Canada Publication 18894/E, Ottawa.
- Maetô, K. 1996. Inter-generic variation in the external male genitalia of the subfamily Microgastrinae (Hymenoptera, Braconidae), with a reassessment of Mason's tribal system. *Journal of Hymenoptera Research* 5: 38–52.
- Schuh, R. T. (ed.). 1989. *The Torre-Bueno Glossary of Entomology* (revised edition). The New York Entomological Society, New York, 849 pp.
- Sharkey, M. J. and R. A. Wharton. 1997. Morphology and terminology, pp. 19–37 in: Wharton, R. A., P. M. Marsh and M. J. Sharkey, eds., *Manual of the New World Genera of the Family Braconidae (Hymenoptera)*, Special Publication of the International Society of Hymenopterists, No.1. 439 pp.
- Townes, H. 1969. *The genera of Ichneumonidae, Part 1; Ephialtinae to Agriotypinae*. *Memoirs of the American Entomological Institute* 11: 1–300.
- Whitfield, J. B. 1997. Mendesellinae, pp. 320–323 in: Wharton, R. A., P. M. Marsh and M. J. Sharkey, eds., *Manual of the New World Genera of the Family Braconidae (Hymenoptera)*, Special Publication of the International Society of Hymenopterists, No.1. 439 pp.
- Whitfield, J. B. & W. R. M. Mason. 1994. Mendesellinae, a new subfamily of the braconid wasp (Hymenoptera, Braconidae) with a review of relationships within the microgastroid assemblage. *Systematic Entomology* 19: 61–76.